ogist with his microscope, the physicist with his spectroscope, and the mathematician with his logic are all busily engaged in unravelling the mysteries of the structure of the universe. They do not always think of their work in this relation. Ordinarily they will tell you that their work is directed towards the answer to some specific question in a relatively circumscribed field. But eventually the mental pictures which result from this detailed work are integrated into one grand picture of the structure of the universe itself, and all that is trustworthy in this grand picture rests upon the labors of the individual workers in their various fields.

There are certain questions, however, of a very fundamental character which no amount of labor will ever answer, and to these questions we are at liberty to return such answers as happen to please us. In other words, they belong to the domain of esthetics and not to the domain of science; and yet they are so deep and fundamental that all of our scientific pictures rest upon them. For example: Is the physical universe limited in space, or is it not limited? If it is not limited, or infinite as we say, is the portion of it which we see peculiar, or is it fairly representative? Is the epoch of time in which we live a peculiar epoch, or is it a fairly representative one? Is the universe as a whole definitely changing from its present state, or is it a permanent thing, the same yesterday, to-day and forever? I might continue with other and similar questions but there is not time now. You are at liberty to choose your own answers and upon them to rest your interpretation of the universe, or your philosophy.

For myself, I wish to think of the physical universe as infinite—it jars upon my sensibilities to think of it otherwise. I am unwilling to admit that we occupy an essentially peculiar position in either space or time. As for the universe as a whole, it has always been and always will be essentially as it is to-day. It is infinite, eternal and unchangeable.

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THE PAN-PACIFIC SCIENTIFIC CONGRESS AND THE BISHOP MUSEUM OF HAWAII

During the month of August, 1920, a congress will be held at Honolulu to outline the scientific problems of the central and southern Pacific Ocean, and to suggest methods for their solution. Delegates from Australia, New Zealand, the United States, and possibly Japan will take part in the discussions, and will formulate a program of research for future guidance in anthropology, geography, geology, and biology. Also it is hoped to lay a foundation for a greater utilization of the economic resources of the Pacific. The delegates are to be the guests of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History, situated in the city of Honolulu. It should be noted here that the idea of a wider Pacific exploration was first put forth by this museum in 1906, and that during the past thirty years the museum has been at work on the ethnology and biology of the central Pacific. Its trustees now desire to take up the wider problems of the Pacific—and they are of fundamental importance—in cooperation with other institutions of research. Yale University, as a result of a gift from Mr. Bayard Dominick of $40,000 for scientific exploration in the southern Pacific, is enabled to enter upon thorough cooperation in the plan, and Professor Herbert E. Gregory, of the Yale faculty, is now the director of the Bishop Museum and the leader of the congress. Other institutions which have expressed a desire to cooperate are the National Academy of Sciences, the National Research Council, the U. S. National Museum, the U. S. Coast and Geodetic Survey, the Carnegie Institution of Washington, Harvard University, the American Museum of Natural History, the California Academy of Sciences, and the Scripps Institution for Biological Research.

That the results already accomplished by the Bishop Museum are extensive may be gathered from the following account. Fernão de Magalhães, making his way southwest across the rough Atlantic, was the first to

pass through the Straits of Magellan, and for nearly four months subsequent to November 28, 1520, sailed over what seemed to him the quiet waters of an unknown ocean, which he accordingly named the *Mer Pacifico*. The Hawaiian Islands were, however, not discovered until 1778, by the world navigator, Captain Cook, who landed on Kauai. In the spring of 1820 a small sailing ship landed a number of New England missionaries in Hawaii, and from that time began the modernization of human culture on the eight inhabited islands of the group. Thus arose the dominancy of the United States in these islands, which were formally annexed in 1898 and constituted the territory of Hawaii in 1900.

Mr. Charles Reed Bishop, of New York, married Princess Bernice Pauahi, the great grand-daughter of the Moi of Hawaii at the time of Cook's visit. She died in 1884, leaving her estate to establish "schools for the youth of her race"; she is often referred to as the "mother of Hawaiian industrial education." In 1889 Mr. Bishop founded in her memory the Bernice Pauahi Bishop Museum, and the following year Dr. William T. Brigham was chosen as its curator, becoming director six years later. The government of the museum is in the hands of a board of seven trustees. The original museum was a small stone building, but two large additions have been made and now it is the leading storehouse of information relating to things Pacific, and more especially to the ethnology of the Polynesian people. The Hawaiian Hall opened in 1903 is unique among museums. This privately endowed institution has made good use of the capital left it, Director Brigham having twice visited the museums of the world in his endeavor to find the best methods of caring for the collections in his charge. Mr. Bishop died in 1915, in his ninetieth year, and Dr. Brigham became director emeritus in 1917. At this time the staff consisted of five curators and eight assistants.

In 1898, the Bishop Museum began the publication of two serials, the smaller Occasional Papers, of which there are now six volumes, and the quarto Memoirs, now in the seventh volume. In looking through these publications, one is impressed by the high scientific character of the studies and the splendid dress of the memoirs. The credit is all the greater, since the publications are not only written by the staff of the museum, but printed by its own presses. The results naturally bulk largest in ethnology, since this was the primary wish of Mr. Bishop. Moreover, the Hawaiian people are no longer living in their original culture, Christianity and the ways of the white man having completely changed their modes of life. The volumes by Dr. Brigham treating of the wonderful feather work done by the Hawaiians, the making of bark cloth, mat and basket weaving, the houses of the natives, their wood carvings and stone implements, are a revelation of the skill of this primitive folk. The director has also interested himself in different lines of study, as is apparent from the titles of others of his works which are of great value: "Index to the Islands of the Pacific," "The Volcanoes of Kilauea and Mauna Loa"—and some of the volcanoes of Hawaii rise to nearly 14,000 feet above sea level—and "A Journey around the World to Study Matters relating to Museums." There is no more interesting account of the world's natural history museums than this one published by Dr. Brigham in 1913.

Most interesting are the three quarto volumes on Hawaiian antiquities and folklore, gathered and written in the native language by Abraham Fornander and translated into English by Thomas G. Thrum. Another native manuscript on Hawaiian antiquities by David Malo is translated by N. B. Emerson.

A large monograph of the flowering plants of the family Lobelioideæ by Joseph F. Rock is a thorough piece of work, while Charles N. Forbes describes in the Occasional Papers many new species of indigenous plants.

The volumes also include a "Key to the Birds of the Hawaiian Group," by W. A. Bryan, and many smaller papers on birds by the same

author and by Alvin Seale. More than 300 species of Pacific marine fishes have been cast and colored from life by J. W. Thompson and described by Bryan and Seale. Of land snails in the islands there appears to be an endless variety, certainly more than 400 forms, and the Museum has them by the hundred thousand. These have been arranged and many new forms described by C. M. Cooke. The collection of marine shells have all been determined by W. H. Dall.

Clearly this is a good beginning toward the gathering of data looking to the solution of the problems of the Pacific Ocean.

Charles Schuchert

SCIENTIFIC EVENTS

COTTON RESEARCH IN LANCASHIRE

The British Cotton-growing Research Association has issued a report covering the first nine months of its work. According to an abstract in the London *Times* actual research work has as yet scarcely begun. Dr. A. W. Crossley, the director of research, was not free to leave the University of London until Easter. The council and director agree that the association's researches will achieve success in proportion to the extent to which they are organized on a cooperative basis, the workers in the several sciences directing their efforts towards the solution of a common problem. In order that the various departments should all be working at one center, a property, known as The Towers, has been acquired at East Didsbury, a Manchester suburb, and the council is about to issue a special building fund appeal for £250,000. The next step anticipated by the council is the appointment of heads of departments on the subjects of chemistry, physics, colloids, botany and technology. Dr. A. E. Oxley, of Cambridge and Sheffield Universities, has been appointed head of the physics department, and Dr. J. C. Withers, of the chemical department, St. Thomas's, London, has been appointed to direct the abstracting and indexing of scientific and technical information in the records bureau. It is stated that information is so scattered that it will be some time before a comprehensive idea can be given of the work accomplished in the past. The report adds that the chief aim will be to arrive at the principles or theory underlying the practise of the industry, leaving the application of the theory to those actively engaged in the industry. Applied research can not, however, be entirely omitted, especially in respect of such matters as may be considered beyond the resources of individual firms.

In cooperation with the Empire Cotton-growing Committee a joint committee has been appointed, with the immediate object of granting scholarships to graduate students, so as to secure a supply of trained men for the future. Three botanical research studentships have already been established. The total number of individual members of the association is 1,408. The income for the year, including £6,750 government grant, amounts to £17,150.

THE BRITISH SCIENCE GUILD

Nature reports the annual meeting of the British Science Guild held in London on June 8. Lord Sydenham, the president, in his address on "Science and the nation," discussed industrial problems, due partly to an abnormal state of mind arising from the war, but originally fostered by the industrial changes of the last century, namely, the general use of machinery, rendering labor monotonous and leaving less room for the individual skill of the craftsman, and the formation of large companies, whereby the personal touch between master and man was lost. In the latter portion of his address Lord Sydenham emphasized the importance of a more general knowledge of science, especially amongst members of the government and the Civil Service, and alluded to the efforts made by the Guild in the dissemination of scientific knowledge and methods. He concluded by quoting Goethe's saying that "there is no more dreadful sight than ignorance in action."

The president-elect, Lord Montagu, of Beaulieu, then delivered an address on "Some national aspects of transport," and afterwards occupied the chair. Lord Montagu remarked upon the growing difficulties of railways, which, although subsidized by the state, were